ENVIRONMENTALLY-SUSTAINABLE AFFORDABLE DESIGN ELEMENTS IN HOUSING: (A case study on middle-income people in the context of Malaysia)

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Dedicated to,

Loving memory of my mother,

Brothers and sisters,

The honorable spirit of my father,

Friends and all beloved and important persons in my life,

For all your love and encouragement,

You are my inspiration...

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ABSTRACT

Hot humid tropical conditions in Malaysia create high temperature and humidity as well as low air flow which affect human comfort especially in residential buildings. Recently, the Malaysian government focused on delivering more number of affordable public and private housing units to the middle-income population. With the global awareness on sustainability, the purpose of this study was to investigate whether environmentally-sustainable design elements in housing design can be integrated within the affordable range of this target group. The research followed the basic three methodological steps namely data collection, data analysis and data interpretation. Secondary data was collected from literature in order to identify all possible sustainable design elements related to the context including both passive and active elements. Seventeen passive and two active elements were identified. After that, they were put together and were divided into two different categories. The first category included those which were within the designers' control and were expected to be integrated within the design process with affordability entrusted with the designers. The second category included those which remain to be within this targeted owners' decision to choose from, depending on their affordability. From analysis, fifteen passive elements were drawn into the first category, and two passive and two active elements were included in the second category. Afterwards, a market study which included interviews with contractors and manufacturers, were conducted in order to determine the market price of each of these elements. A five-point Likert-scale questionnaire survey was conducted through conditional sampling (sample size: twenty) in order to test opinions of the target group on these four elements regarding affordability. It was found that only one of them namely solar water heating system was within their affordable range. Totally, sixteen elements were found to be affordable by this target group. Qualitative interpretation was drawn with the help of open ended interviews with selected owners in order to find out the reasons. Finally, some recommendations were made which could help improve the environmental sustainability of the affordable housing targeted to middle income people in Malaysia.

ABSTRAK

Keadaan iklim tropika di Malaysia yang panas lembap mewujudkan/menghasilkan suhu tinggi dan kelembapan serta aliran udara rendah yang mempengaruhi tahap keselesaan manusia terutaman dalam bangunan kediaman. Terkini, kerajaan Malaysia telah memberi tumpuan terhadap keperluan menyediakan perumahan awam dan swasta mampu milik khususnya kepada golongan berpendapatan sederhana. Dengan kesedaran global mengenai kemampanan, kajian ini bertujuan menyiasat keupayaan elemen-elemen reka bentuk yang mampan dalam mereka bentuk sesebuah kawasan perumahan untuk kumpulan sasaran ini. Terdapat tiga tahap asas kaedah kajian iaitu pengumpulan data, menganalisis dan mentafsir data. Data sekunder telah dikumpulkan dari pelbagai kajian untuk mengenal pasti elemen-elemen reka bentuk yang mampan sama ada elemen pasif atau aktif. Tujuh belas elemen pasif dan dua elemen aktif telah dikenalpasti. Kedua-dua elemen telah digabungkan bersama serta dikategorikan kepada dua jenis kategori berbeza. Kategori pertama ialah orang yang berada di bawah pengaruh pereka bentuk yang mereka bentuk mengikut kemampuan pereka.Kategori kedua termasuk orang-orang yang tetap berada dalam keputusan untuk memilih dari, bergantung kepada kemampuan mereka ini pemilik disasarkan. Dari analisis, lima belas unsur pasif telah ditarik ke dalam kategori yang pertama, dan dua pasif dan dua elemen aktif telah dimasukkan ke dalam kategori kedua. Selepas itu, satu kajian pasaran yang termasuk temu bual dengan kontraktor dan pengeluar, telah dijalankan untuk menentukan harga pasaran kobolehpasaran setiap elemen-elemen ini. Soal selidik skala Likert lima mata telah dijalankan melalui penyampelan pensampelan bersyarat (saiz sampel: dua puluh) untuk menguji pendapat kumpulan sasaran atas empat elemen mengenai kemampuan. Ia telah mendapati bahawa hanya salah satu daripada mereka iaitu air solar sistem pemanasan adalah dalam lingkungan yang berpatutan mereka. Enam belas elemen telah ditemui untuk menjadi berpatutan oleh kumpulan sasaran ini. Tafsiran kualitatif telah disediakan dengan bantuan wawancara berakhir terbuka dengan pemilik terpilih untuk mengetahui sebab-sebab.